

CLAIMS

1. An electric camera comprising:  
an image sensing device with a light receiving surface having  $N$  vertically arranged pixels and an arbitrary number of pixels arranged horizontally,  $N$  being equal to or more than three times the number of effective scanning lines  $M$  of a display screen of a television system;  
a driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of every  $K$  pixels to produce a number of lines of output signals which corresponds to the number of effective scanning lines  $M$ ,  $K$  being at least one of integers equal to or less than an integral part of a quotient of  $N$  divided by  $M$ ; and  
a signal processing unit to generate image signals by using the output signals of the image sensing device.
2. An electric camera according to claim 1, wherein the driver drives the image sensing device to read out or discard the signal charges of a pixel area corresponding to  $N - K \cdot M$  pixels during a vertical blanking period of the television system to extract the signal charges of a pixel area corresponding to  $K \cdot M$  pixels from the  $N$  vertically arranged pixels of the image sensing device during a vertical effective scanning period of the television system and thereby obtain a number of lines of output signals which corresponds to the number of effective scanning lines

$M, N-K \cdot M$  being the  $N$  vertically arranged pixels of the image sensing device minus a product  $K \cdot M$  of the number of pixels to be cyclically mixed or culled  $K$  and the number of effective scanning lines  $M$ .

3. An electric camera according to claim 1, wherein the signal processing unit has a function of:

extracting an output signal period corresponding to that horizontal segment which virtually matches an aspect ratio of the television system with respect to a vertical height of the extracted pixels in the light receiving surface of the image sensing device, and

outputting the signals of the extracted horizontal segment over the entire horizontal effective scanning period of the television system.

4. An electric camera according to claim 1, wherein the driver drives the image sensing device to shift, in each display cycle of the television system, positions of the pixels to be cyclically mixed or culled and thereby output interlaced signals.

5. An electric camera according to claim 4, wherein the signal processing unit has a function of interpolating vertical positions of gravity centers of the interlaced output signals obtained by the mixing or culling so that a phase difference between the gravity centers on two interlaced fields is 180 degrees.

6. An electric camera according to claim 1, wherein the image sensing device can vertically mix or cull those numbers of pixels which are at least two of integers equal

to or less than an integral part of a quotient of the number of vertically arranged pixel rows N divided by the number of effective scanning lines M, and the driver drives the image sensing device in at least two modes corresponding to the at least two integers.

7. An electric camera according to claim 6, wherein the driver for the image sensing device changes the number of pixels to be cyclically mixed or culled according to input information from a switch, such as a zoom switch, provided inside or outside the camera which requests a view angle change.

8. An electric camera according to claim 6, further including a gain adjust unit for adjusting a gain of the output signals of the image sensing device, wherein, when the number of pixels to be cyclically mixed changes, a gain of the gain adjust unit is changed according to the number of pixels to be cyclically mixed on the image sensing device so that an output signal level of the gain adjust unit remains constant.

9. An electric camera according to claim 1, further including an image-unstability detector for detecting an image-unstability of the electric camera,

wherein a vertical height and horizontal width size and a position of an area to be extracted from the light receiving surface is changed according to an amount of image-unstability detected by the instability detector to correct the image-unstability.

10. An electric camera comprising:

an image sensing device with a light receiving surface having  $N$  vertically arranged pixels and an arbitrary number of pixels arranged horizontally,  $N$  being equal to or more than three times the number of effective scanning lines  $M$  of a display screen of a television system;

a driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of  $K$  pixels to produce, during a vertical effective scanning period of the television system, a number of lines of output signals which corresponds to  $1/K$  the number of vertically arranged pixels  $N$  of the image sensing device,  $K$  being an integer larger than an integral part of a quotient of  $N$  divided by  $M$ ; and

a signal processing unit having a function of generating image signals by using the output signals of the image sensing device.

11. An electric camera comprising:

an image sensing device with a light receiving surface having  $N$  vertically arranged pixels and an arbitrary number of pixels arranged horizontally,  $N$  being equal to or more than three times the number of effective scanning lines  $M$  of a display screen of a television system;

a first driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of every  $K$  pixels to produce a number of lines of output signals which corresponds to the number of

effective scanning lines  $M$ ,  $K$  being at least one of integers equal to or less than an integral part of a quotient of  $N$  divided by  $M$ ;

a second driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of every  $K$  pixels to produce, during a vertical effective scanning period of the television system, a number of lines of output signals which corresponds to  $1/K$  the number of vertically arranged pixels  $N$  of the image sensing device,  $K$  being an integer larger than an integral part of a quotient of  $N$  divided by  $M$ ; and

a signal processing unit to generate image signals by using the output signals of the image sensing device;

wherein the driving by the first driver and the driving by the second driver are selectively switched according to input information from a switch provided inside or outside the electric camera.

12. An electric camera according to claim 1, further including a trigger device such as a shutter button, wherein, when a trigger is produced by the trigger device, the signal charges accumulated in individual pixels of the image sensing device are not cyclically mixed but are read out independently for all pixels.

13. An electric camera according to claim 1, wherein color filters that pass first, second and third colors respectively are arranged to cyclically appear horizontally at three-pixel intervals and color filters that pass the

same colors are arranged vertically.

14. An electric camera according to claim 13, wherein the first, second and third colors are yellow, green and cyan, respectively.

15. An electric camera according to claim 13, wherein the first, second and third colors are yellow, white and cyan, respectively.

16. An electric camera according to claim 13, wherein the first, second and third colors are red, green and blue, respectively.